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In re Patent Application of: Broberg et al.

Application No.: 10/722,575

Group Art Unit: 1791

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Examiner: Goff II, John L.

For: A PROCESS FOR THE MANUFACTURING OF A THERMOSETTING LAMINATE

CLAIM FOR PRIORITY AND SUBMISSION OF DOCUMENTS

Commissioner for Patents
Washington, DC 20231

Dear Sir:

Applicant hereby claims priority under 35 U.S.C. 119 based on the following prior foreign application filed in the following foreign country on the date indicated:

Country	Application No.	Date
Sweden	0203596-2	2002-12-02

In support of this claim, a certified copy of the said original foreign application is filed herewith.

Applicant believes no fee is due with this submission. However, if a fee is due, please charge our Deposit Account No. 14-1437, under Order No. 8688.027.US0000 from which the undersigned is authorized to draw.

Dated: August 25, 2008

Respectfully submitted,

By _____

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PATENT- OCH REGISTRERINGSVERKET

Intyg
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Härmed intygas att bifogade kopior överensstämmer med de handlingar som ursprungligen ingivits till Patent- och registreringsverket i nedannämnda ansökan.

This is to certify that the annexed is a true copy of the documents as originally filed with the Patent- and Registration Office in a connection with the following patent application.

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Applicant (s)

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A process for the manufacturing of a thermosetting laminate.

The present invention relates to a process for the manufacturing of a decorative thermosetting laminate with a damping layer intended to decrease the sound-level.

Products coated with thermosetting laminate are common nowadays. They are foremost used where the demands on abrasion resistance are great, but also where resistance towards different chemicals and moisture are demanded. As example of such products can be mentioned floors, floor beadings, work tops, desk tops and wall panels.

The thermosetting laminate most often consists of a number of base sheets with decor sheet arranged closest to the surface. The decor sheet can be provided with a desired decor or pattern. Such laminates are very hard in order to withstand the wear they are exposed to. This will unfortunately lead to a high noise level when hard objects are retarded suddenly by the laminate surface, such as hard heels towards a laminate surface.

It is desirable to be able to muffle the sound level in locales with a floor surface of laminate, specially in locales where shoes normally are used.

It has, through the present invention, been made possible to meet the above mentioned desires and a thermosetting laminate with a lower noise level has been achieved. Accordingly, the invention relates to a process for the manufacturing of a decorative laminate. The laminate comprises an upper decorative and abrasion resistant thermosetting laminate layer and a carrying core. The invention is characterised in that the upper side of the core is provided with the abrasion resistant thermosetting laminate and that the lower side of the core is provided with a balance layer. The balance layer have the purpose of preventing warping of said decorative laminate and is at the same time having the purpose of acoustic dampening. The balance layer comprises a layer of a polymer, whereby said balance layer and said thermosetting laminate are joined with said core by means

of pressing. The achieved laminate is then cut into panels and provided with edges intended for joining.

The thermosetting laminate is preferably constituted by one or more decor papers impregnated with melamine-formaldehyde resin and one or more overlay sheets impregnated with melamine formaldehyde resin arranged on top of the decor papers. The thermosetting laminate may further possibly constitute one or more conventional resin impregnated underlay papers, arranged under the decor paper or decor papers, which underlay papers preferably contains phenol-formaldehyde resin. The different papers are laminated together under increased pressure and increased temperature. At least one of the sheets impregnated with thermosetting resin, preferably the outermost, is provided with hard particles of for example silicon oxide, aluminium oxide and/or silicon carbide with an average size of 1 -100 μm, preferably around 5 - 60 μm. The thermosetting laminate suitably has a thickness in the range 0.3 mm - 1.2 mm, preferably 0.3 mm - 0.9 mm and a density in the range 1250 - 1500 kg / m^3.

The carrying core is suitably constituted of a particle board, a fibre board or an oriented strand board. It is also possible to use a board based on polymers such as polyurethane or a fibre cement board. A polymer based board may further comprise fibre and particles.

The balance layer is suitably constituted of a thermoplastic elastomer. The balance layer suitably has elasticity compression coefficient in the range 0.5 - 2.7 Mpa, preferably 0.8 - 2.0 Mpa as measured according to ISO 3386-1 with supplement from ISO 7214. The balance layer preferably has a thickness in the range 0.1 - 5 mm, preferably 0.2 - 1 mm. The balance layer is suitably constituted of an expanded physically cross-linked polyolefin with closed cells and suitably has a density in the range 50 - 400 kg/m^3, preferably 80 - 330 kg/m^3.

According to another embodiment of the invention the balance sheet is constituted by a non-woven fibre arranged on a polyolefin foil. The non-woven fibre is

suitably constituted by polypropylene, polyester, viscose or the like while the polyolefin foil suitably is constituted of polyethylene. The balance layer suitably has an unloaded average thickness in the range 0.3 - 5 mm and an unloaded density in the range 150 - 800 kg/m^3.

According to one embodiment of the invention the balance sheet further comprises a conductive material. The purpose of this conductive material is to reduce the risk for build-up of static charges. The conductive material may be constituted of carbon black or of carbon fibre. It is also possible to use a conductive material which is constituted of a vacuum metallized layer. Such a metallized layer is then suitably constituted of aluminium. The conductivity is preferably better than 500kΩcm.

The balance layer and the thermosetting laminate is suitably joined with the carrying core by means of glue and pressure. The glue can hereby be constituted by a water-soluble standard glue or a so-called melt-glue. In the latter case the balance layer, the carrying core and the thermosetting laminate joined via heat and pressure. It is also possible to let the balance layer itself work as a melt-glue layer. The balance layer is then suitably non-expanded and will then have a density in the range 400 - 900 kg/m^3.

A an alternative to having conductive materials in the balance sheet it is also possible to use a glue which comprises a conductive material. This glue may then contain a conductive material which is constituted of carbon black or of carbon fibre. Also here the conductivity is suitably better than 500kΩcm.

CLAIMS

1. A process for the manufacturing of a decorative laminate, which laminate comprises an upper decorative and abrasion resistant thermosetting laminate layer and a carrying core, wherein the upper side of the core is provided with the abrasion resistant thermosetting laminate and that the lower side of the core is provided with a balance layer, said balance layer having the purpose of preventing warping of said decorative laminate and at the same time having the purpose of acoustic dampening, said balance layer comprising a layer of a polymer, whereby said balance layer and said thermosetting laminate are joined with said core by means of pressing, whereupon the achieved laminate is cut into panels and provided with edges intended for joining.

2. A process according to claim 1, wherein the thermosetting laminate is constituted by one or more decor papers impregnated with melamine-formaldehyde resin and one or more overlay sheets impregnated with melamine formaldehyde resin arranged on top of the decor papers and possibly one or more conventional resin impregnated underlay papers, arranged under the decor paper or decor papers, which underlay papers preferably contains phenol-formaldehyde resin, which papers are laminated together under increased pressure and increased temperature.

3. A process according to claim 1, wherein the carrying core is constituted by a particle board.

4. A process according to claim 1, wherein the carrying core is constituted by a fibre board.

5. A process according to claim 1, wherein the carrying core is constituted by an oriented strand board.

6. A process according to claim 1, wherein the carrying core is constituted by a board based on polymers such as polyurethane.

7. A process according to claim 1, wherein the carrying core is constituted by a fibre cement board.

8. A process according to claim 6, wherein the board further comprise fibre.

9. A process according to claim 6, wherein the board further comprise particles.

10. A process according to claim 2, wherein at least one of the sheets impregnated with thermosetting resin, preferably the outermost, is provided with hard particles of for example silicon oxide, aluminium oxide and/or silicon carbide with an average size of 1 -100 μm, preferably around 5 - 60 μm.

11. A process according to claim 2 or 10, wherein the thermosetting laminate has a thickness in the range 0.3 mm - 1.2 mm, preferably 0.3 mm - 0.9 mm.

12. A process according to claim 2, 10, or 11, wherein the thermosetting laminate has a density in the range 1250 - 1500 kg / m^3.

13. A process according to claim 1, wherein the balance layer is constituted of a thermoplastic elastomer.

14. A process according to claim 13, wherein the balance layer has elasticity compression coefficient in the range 0.5 - 2.7 Mpa, preferably 0.8 - 2.0 Mpa.

15. A process according to claim 13 or 14, wherein the balance layer has a thickness in the range 0.1 - 5 mm, preferably 0.2 - 1 mm.

16. A process according to any of the claims 13 - 15, wherein the balance layer has a density in the range 50 - 400 kg/m^3, preferably 80 - 330 kg/m^3.

17. A process according to any of the claims 13 - 16, wherein the balance layer is joined with the carrying core by means of glue and pressure.

18. A process according to claim 1, wherein the balance sheet is constituted by a non-woven fibre arranged on a polyolefin foil.

19. A process according to claim 18, wherein the non-woven fibre is constituted by polypropylene.

20. A process according to claim 18 or 19, wherein the polyolefin foil is constituted of polyethylene.

21. A process according to any of the claims 18 - 20, wherein the balance layer has an unloaded average thickness in the range 0.3 - 5 mm.

22. A process according to any of the claims 18 - 21, wherein the balance layer has an unloaded density in the range 150 - 800 kg/m^3.

23. A process according to any of the claims 13 - 22, wherein the balance sheet further comprises a conductive material.

24. A process according to claim 23, wherein the conductive material is constituted of carbon black.

25. A process according to claim 23, wherein the conductive material is constituted of carbon fibre.

26. A process according to claim 23, wherein the conductive material is constituted of a vacuum metallized layer.

27. A process according to claim 26, wherein the metallized layer is constituted of aluminium.

28. A process according to any of the claims 23 - 27, wherein a conductivity is better than 500kΩcm.

29. A process according to any of the claims 1 - 28, wherein the thermosetting laminate is joined with the carrying core by means of glue and pressure.

30. A process according to any of the claims 1 - 29, wherein the balance layer and/or the thermosetting laminate is joined with the carrying core by means of melt-glue, heat and pressure.

31. A process according to any of the claims 1 - 22, wherein the balance layer and/or the thermosetting laminate is joined with the carrying core by means of glue, heat and pressure.

32. A process according to claims 31, wherein the glue comprises a conductive material.

33. A process according to claim 32, wherein the conductive material is constituted of carbon black.

34. A process according to claim 32, wherein the conductive material is constituted of carbon fibre.

35. A process according to any of the claims 32 - 34, wherein a conductivity is better than 500kΩcm.

ABSTRACTS:

A process for the manufacturing of a decorative laminate, which laminate comprises an upper decorative and abrasion resistant thermosetting laminate layer and a carrying core. The upper side of the core is provided with the abrasion resistant thermosetting laminate while the lower side of the core is provided with a balance layer. This balance layer has the purpose of preventing warping of said decorative laminate while at the same time having the purpose of acoustic dampening. The balance layer comprises a layer of a polymer. The balance layer and the thermosetting laminate are joined with said core by means of pressing. The achieved laminate is then cut into panels and provided with edges intended for joining.